PASSIVE CHILD THERAPY TRICYCLE

Background of the Invention

This invention relates to the field of medical exercise equipment. More particularly, an attractive child's exercise tricycle is presented that allows for the passive exercise of a child who is unable to move his or her legs.

In the field of exercise equipment, it is often necessary to have motorized equipment to exercise injured or impaired patients. Injuries could result in the paralysis of the arms or legs, or the paralysis could be the result of a congenital disease. In either case, the patient needs to have the muscles of the arms or legs worked so that they do not become atrophied.

There are common exercise regimens practiced throughout the healthcare and rehabilitative industry. However, most of those exercises involve manual movement of the limbs by a nurse practitioner or rehabilitative worker, or an unglamorous motorized movement of the muscle groups. No motorized rehabilitative apparatus has been especially designed to attract children by simulating a real child's toy tricycle. It is an object of this invention to provide a rehabilitative motorized exercise apparatus that is attractive to children.

One motorized physical therapy apparatus is found in the 1996 patent issued to Higer. The Higer patent includes a therapy apparatus for a paraplegic who cannot walk or for a patient who has had hip surgery. The apparatus is in a motorized stage with varying speeds. The patient is able to walk along with the motorized therapy apparatus. Another motorized walker is found in the 1975 patent issued to Hickman, US Patent 3,872,945. While useful for rehabilitative purposes, neither of these machines would be attractive to a child.

In addition to motorized walkers, motorized physical therapy machines have been devised to exercise the leg, arm, and head members. One such machine is found in the 1993 patent issued to Sweeny, US Patent 5,207,216. The Sweeny machine has a number of cranks that are operatively connected to an electric motor to enable the patient's muscle groups to be exercised. Again, while the Sweeny apparatus is utilitarian in nature it would not be attractive to a child and is, in fact, ominous in appearance.

While the prior art does disclose certain devices for exercising muscle groups, no prior art device has been directed to the particular specialty field involving children's exercise equipment. Especially for children, the attractiveness of the exercise equipment can greatly facilitate the child's interest and use of the machine. If a machine were devised which simulates a normal child's tricycle, the child/patient would be more likely to frequently use the machine. An object of this invention is to provide a motorized exercise physical therapy machine that closely resembles a child's real bicycle, thus enhancing the usefulness of such devices.

Since children are in their growth years, it would be highly desirable to create an exercise tricycle that would adjust as the child grows. In order to facilitate such an adjustment, it is an object of this invention to provide a motorized child's exercise tricycle that has a horizontally adjustable seat and handle bars as well as a vertically adjustable handle bar mechanism.

As the child becomes more accustomed to the exercise of the muscle/leg groups, the speeds and length of an exercise should be increased to increase muscle tone and strength. It is a still further object of this invention to provide an electronic module for a motorized exercise tricycle that can be programmed to increase the revolutions per minute, the speed of the pedals, or the length of time of operation of the exercise device.

Other and further objects of this invention will become apparent upon reading the below-described specifications.

Brief Description on the Invention

A child's physical exercise tricycle is presented having a motorized pedal section and adjustable seat and handle bar sections. The exercise

bicycle is stationary, that is it does not move from a set location. Although the tricycle simulates a real tricycle, the wheels do not turn on the exercise tricycle. The seat of the tricycle is adjustable in a horizontal direction, and the handlebars are also adjustable in a horizontal direction. The handlebars are also adjustable in a vertical direction. These three adjustments allow the tricycle to conform to different children's heights, and even to conform to a child's growth pattern over a period of time.

The pedals of the tricycle are rotatably and operatively connected to an electric motor. The electric motor can be programmed to adjust the speed and length of rotation of a central sprocket. The sprocket is connected to a pair of pedals as in a normal tricycle. A module may program the electric motor such that the speed and length of time of the exercise may be varied. Special foot brackets are provided to ensure that the feet of the child using the exercise tricycle will remain on the pedals during the exercise. A tray table may replace the handlebars so that the child may also eat during the exercise being performed.

Brief Description of the Drawing Figures

Figure 1 is a perspective view of the passive child's therapy bicycle.

Figure 2 is a side view of the therapy tricycle.

Figure 3 is a partial enlarged view of the electric drive mechanism.

Figure 4 is a schematic view of the control module.

Figure 5 is a partial side view of the device utilizing the inner tray replacement for the handlebars.

Detailed Description of the Preferred Embodiment

A stationary pediatric exercise tricycle is designed to simulate the appearance of a child's tricycle yet enable the adult to program an electric motor so as to exercise the feet and legs of the child. The pediatric exercise tricycle is specifically designed for children with leg muscle deficits.

Often the leg muscles can be strengthened by daily exercise of an immobile child's muscles. While prior devices have enabled therapists or adults to aid children in the exercise of their legs, this particular device provides a programmable electric motor that automatically exercises the child's leg without any additional effort on the part of the adult.

The stationary pediatric exercise tricycle has a front stationary wheel 1 and a pair of rear stationary wheels 2. The wheels are decorative only, and they do not move. The trike also has an irregularly shaped seat 6. A handle bar frame member 3 connected to a rear axle 4 and to the front portion of the tricycle as shown. The wheels, frame, and axle are designed to look like a normal child's tricycle.

Connected to the rear of the tricycle is a horizontal seat support 5. This seat support may have a square cross section, or it may be in the form of a tube. The horizontal seat support 5 supports a seat 6. The seat six may be of any shape or form, and the seat shown in the drawing figures is for illustration purposes only. The seat may appear as is shown, or may have a longer torso section or seat section. In addition, the seat may have additional sides, arms, or cushioning as desired.

The seat 6 is affixed to a slidable seat bracket 7. The cross section of the slidable seat bracket 7 should be square or circular to match the cross section of the horizontal seat support 5. The slidable seat bracket 7 allows an adult to adjust the horizontal position of the seat 6 so as to accommodate different sizes of children who may utilize the exercise bicycle. Once adjusted to its desired position, the seat 7 is tightened in place by seat adjusting knob 8.

The seat is also provided with a suitable seatbelt 9 which is approximately 1 ½" thick. The seatbelt fits around the waist of the child and between the legs. It also has an element that may be placed higher up on the trunk such as standard seat belts. The seatbelt shown is for illustration purposes only. Any type of standard variation of the seatbelt is within the spirit and disclosure of this invention.

The handlebars are also adjustable in both the vertical and horizontal directions. An oblique handle bar frame 10 supports the handlebar. A handlebar support 11 is designed to be inserted within the oblique handlebar frame 10, as best shown in Figure 2. The oblique handlebar frame 10 and

handle bar support 11 have identical corresponding cross sections (either square or circular) to enable the handlebar to be adjusted in a vertical direction. Handlebars 12 are attached to the handlebar support 11 in a conventional manner. The vertical position of the handlebars may be adjusted by sliding the handlebar support 11 within the handlebar frame 10 and tightening the handlebar-adjusting knob 13.

The handlebars may also be adjusted in a horizontal position in a similar manner as the vertical position of the handlebar and the horizontal adjustment of the seat are accomplished. The handlebars are attached to handlebar bracket 28. This handlebar bracket 28 is located around a horizontal portion 29 of the handlebar support 11. The handlebars are thus slidably positioned around the horizontal portion 29 of the handlebar support. The horizontal position of the handlebars 12 may be adjusted and then tightened by handlebar horizontal adjusting knob 14.

The means for the horizontal adjustments of the seat and handlebar, as well as the vertical adjustment of the handlebars, are well known in the art. For example, the adjustment mechanism disclosed in the 1987 design patent issued to Aalto, U.S. Patent D291, 462 as well as the horizontal and vertical adjusting mechanisms disclosed in U.S. Patent 6, 612,970 B2 issued to Forcillo are illustrative of the current state of the art.

The pediatric exercise tricycle is equipped with a pair of pedals 15 which are connected to a common axle 26 by pedal/axle rods 21. Left and right pedals 15 have left and right pedal/axle rods 21, respectively, which are mechanically connected to the pedal axle 26.

In order to ensure the safety of the child utilizing the exercise tricycle, each pedal has a safety bracket that comprises transverse Velcro straps 16 and a shoe back and side support 27. These features are best shown on Figure 1. The Velcro straps 16 and shoe back and side support 27 keep the child's shoe in place. The back support ensures that the child's shoe cannot slip out the back. The side supports help keep the foot straight and the leg in the correct position for the exercise.

A key feature of the device is that it is motorized, enabling children with low or no muscle tone in their lower extremities to exercise their legs with the aid of an electric motor.

Electric motor 17 is connected near the front portion of the tricycle as shown. The electric motor 17 has a motor pulley 18 that is connected to the pedal pulley 20 by means of belt 19. A tensioning mechanism 24 may also be utilized to keep the pulley belt 19 in tight condition. The location of the electric motor, as well as the precise means for moving the pedal pulley 20, is shown here as means of illustration only and not as a limitation. It is possible that other types of motors, pulley mechanisms, and drive mechanisms may be utilized in practicing this invention while still keeping within the spirit and disclosure herein.

A control module 22, illustrated in Figure 4 controls the electric motor. The control module 22 may be located in any convenient place on the exercise tricycle. The control module 22 has a display unit that shows the speed, rpm's, distance theoretically traveled, and length of time of operation of the motor. The module is equipped with a start and stop button as well as programming functions to allow the adult to program the electric motor.

Using the control module, the adult will be able to set the speed using one electronic module input and the length of time of operation by utilizing the programmable module. Once the control module is set, it can be locked so that the child cannot change the settings. The clock can be set to count down the time left in the exercise or to keep track of the time the child has already exercised. The speed and rpm's of the movement of the pedals can also be set by the control module so that the adult can closely supervise the periodic exercise of the child using the exercise tricycle. The control module is connected to the electric motor by the control module cable 23.

An added feature of this particular device is a removable tray 25 illustrated in Figure 5. This removable tray 25 would take the place of the handle bar mechanism 11 and 12. The tray has its own insertable stem 30 for connecting the tray to the tricycle handlebar frame 10. The tray would enable the child using the exercise tricycle to eat, draw, or play while performing the exercise.

The exercise tricycle is designed for children to enable them to exercise their legs and to get a cardio workout at the same time. The pedals are moved electronically so the child can get a work out at a consistent pace. The tricycle is unique because it is designed for children. It has special features such as the seatbelt, foot and leg support, horizontally adjustable seat and horizontally and vertically adjustable handlebars. Utilizing these special

features, a child can use the exercise tricycle alone. With the speed, distance and time displayed, an adult will be able to monitor the child's progress.

The exercise tricycle is especially designed for children and is more appealing to them because of its bright primary colors and its exciting look that simulates a real tricycle. Because the tricycle is adjustable, it can also grow as the child grows.

The exercise tricycle fulfills the need for children with low or no muscle tone in their lower extremities. The tricycle enables such children to exercise their legs. This exercise, in turn, will increase blood circulation, range of motion, and will also strengthen muscles. While utilizing the exercise tricycle, the exercise will also decrease atrophy and muscle spasms while allowing the child to obtain a cardio workout simultaneously. Because the tricycle is stationary, it can be used year around.

The tricycle is designed to sit low to the ground. Since the handlebars are adjustable, they allow the child to hold onto the handlebars without leaning forward. The handlebars can be set using a pop-pin mechanism or may be infinitely adjustable using the slidable mechanism and adjusting knobs as shown in the drawing figures.